

# HYDROGEN RELIEF VALVE SIZING FOR THE MUCOOL VACUUM VESSEL

/ Anderson Greenwood

Anderson, Greenwood data base

Absorber volume (liter)	25.000 liter
Pressure of the system, MAWP	25.000 psia

## W, Mass-flow rate = Q/Delta\_H

A, Surface of the wetted area	4370 cm^2
Q, Flux from wetted area (q=20W/cm^2)	87400 Watt
Latent heat of H2	443 kJ/kg
<b>W, Mass flow</b>	<b>1565.873 lb/hr</b>
	197.300 g/s
M (hydrogen)	2.020
W, flow capacity (lbs/hr)	1565.9
<b>V (SCFM)</b>	<b>4899.167</b>

$$V = \frac{W * 6.32}{M}$$

## Calculation of the relief valve area

T, absolute temperature	520.000 R
M, Molecular weight of H2	2.020
Z, compressibility	1.000
K, valve discharge coefficient	0.816
DP, pressure drop absorber to valve	0.200 psi
P1, pressure at valve inlet	25.200 psia
C, gas constant	356.000
<b>A, required area of orifice</b>	<b>3.432 in^2</b>
Diameter	2.091 in

